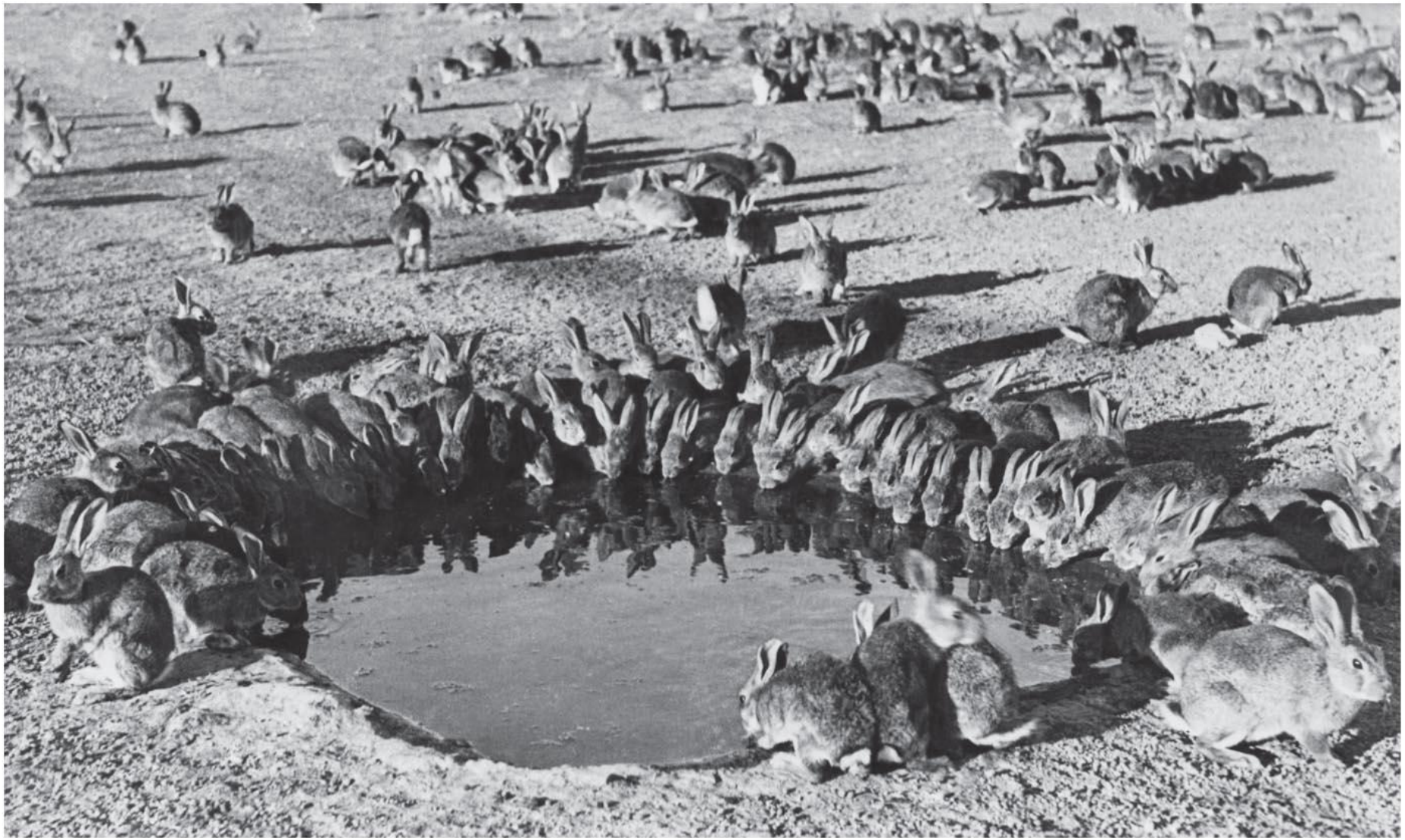
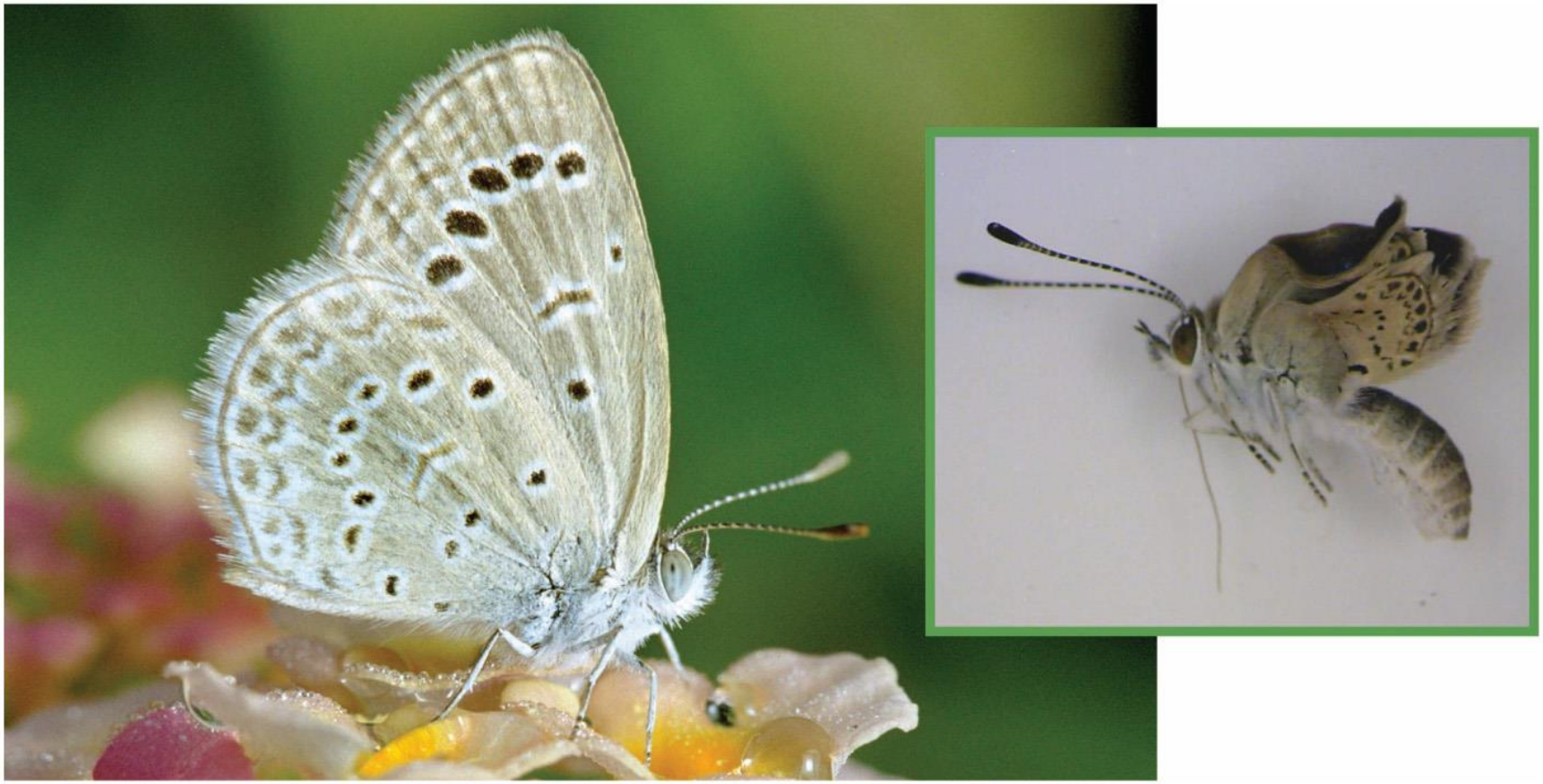
Chapter 4: Organism and Population Ecology and Evolution (part 1)

EN SP 2000

Genetic Change and Population Growth—Fact and Fiction

- Population growth
  - European rabbit in Australia
    - Non-native with few predators
    - Population exploded
- Genetic change
  - DNA controls growth and development
  - Environment can alter DNA
    - Frogs in Great Lakes
      - Pesticides

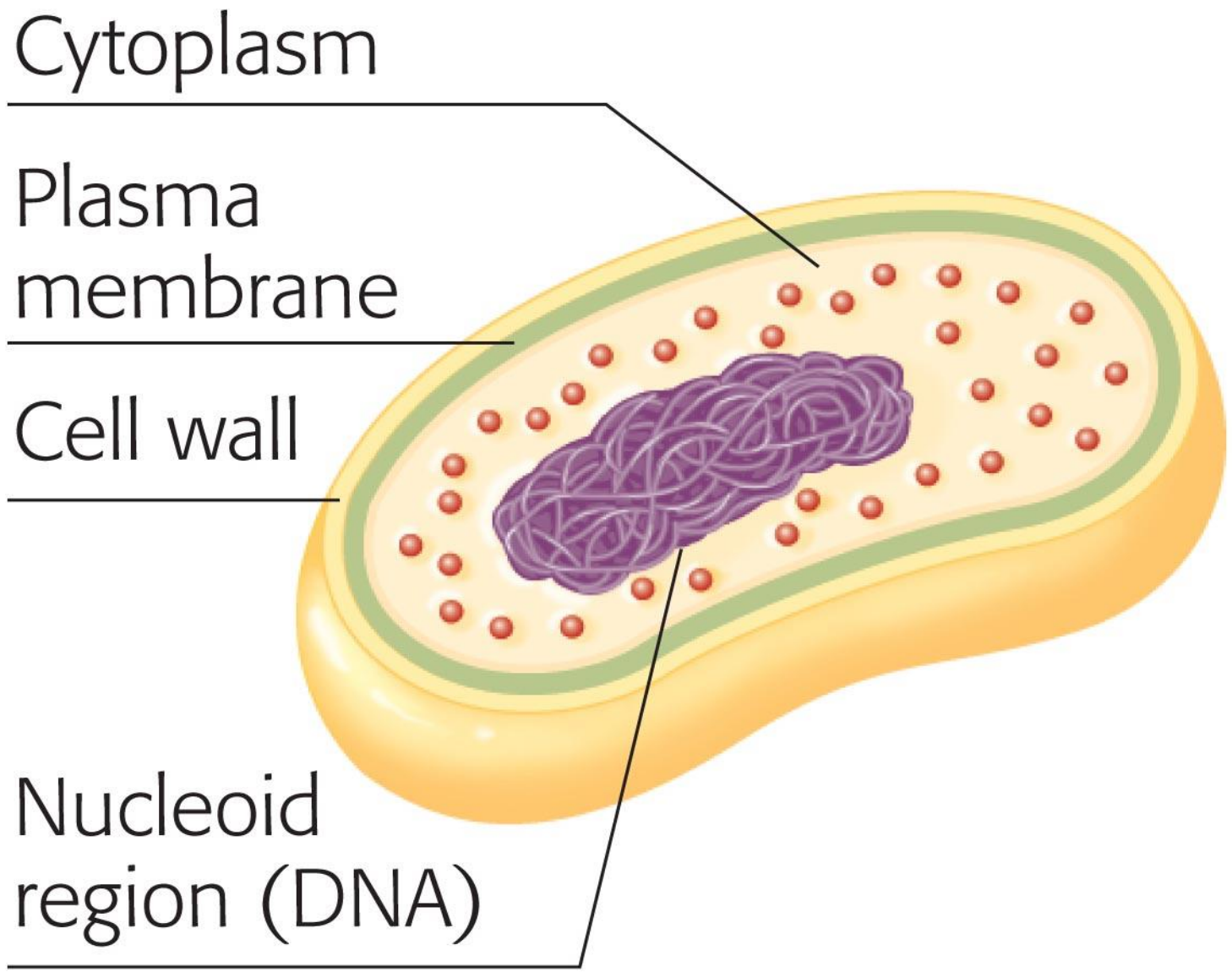


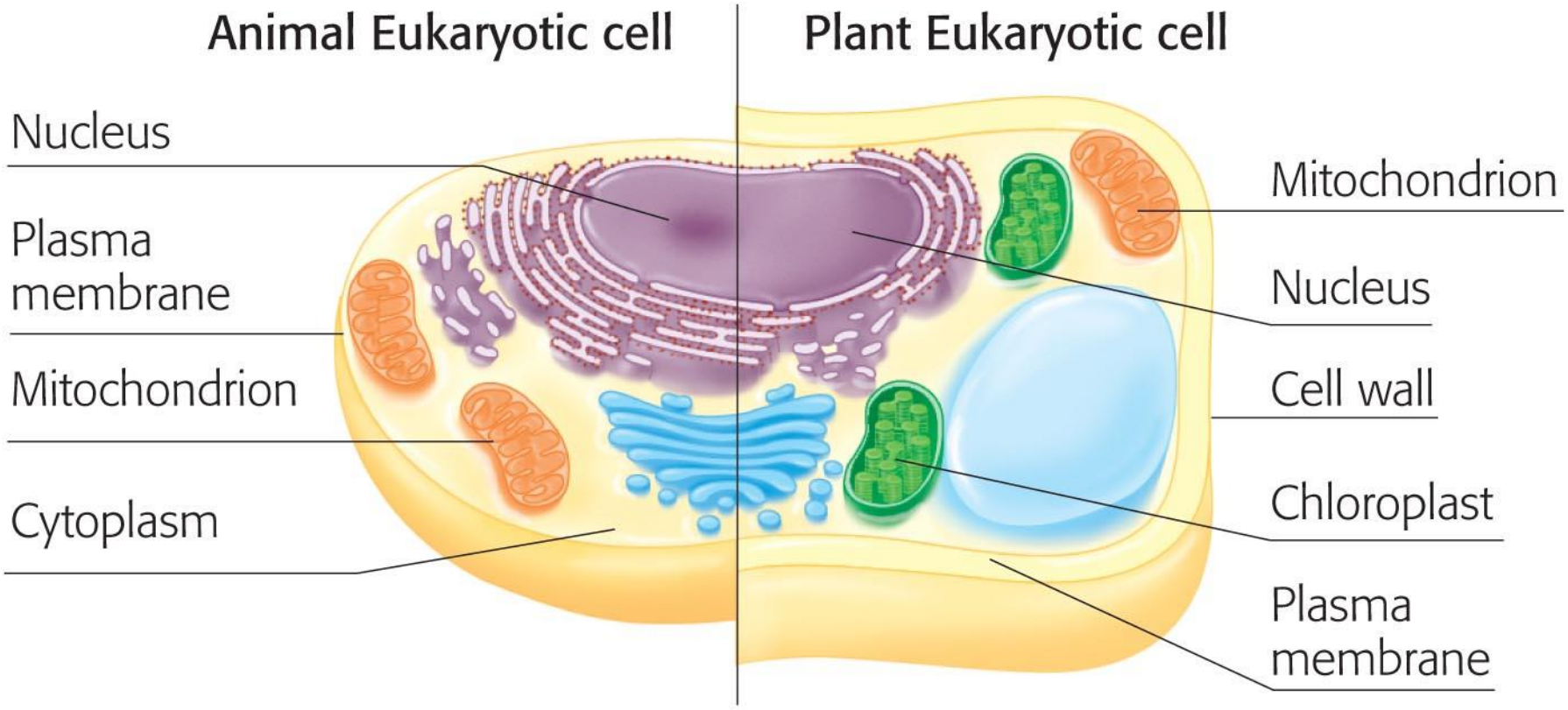


4.1 The Cell—The Fundamental Unit of Life

- The cell
  - Fundamental unit of life
    - Cell structure categorizes
    - Prokaryotes
      - Small, single celled, DNA in single chromosome
    - Eukaryotes
      - Single or multicelled
      - Membrane-enclosed organelles
      - DNA in multiple chromosomes

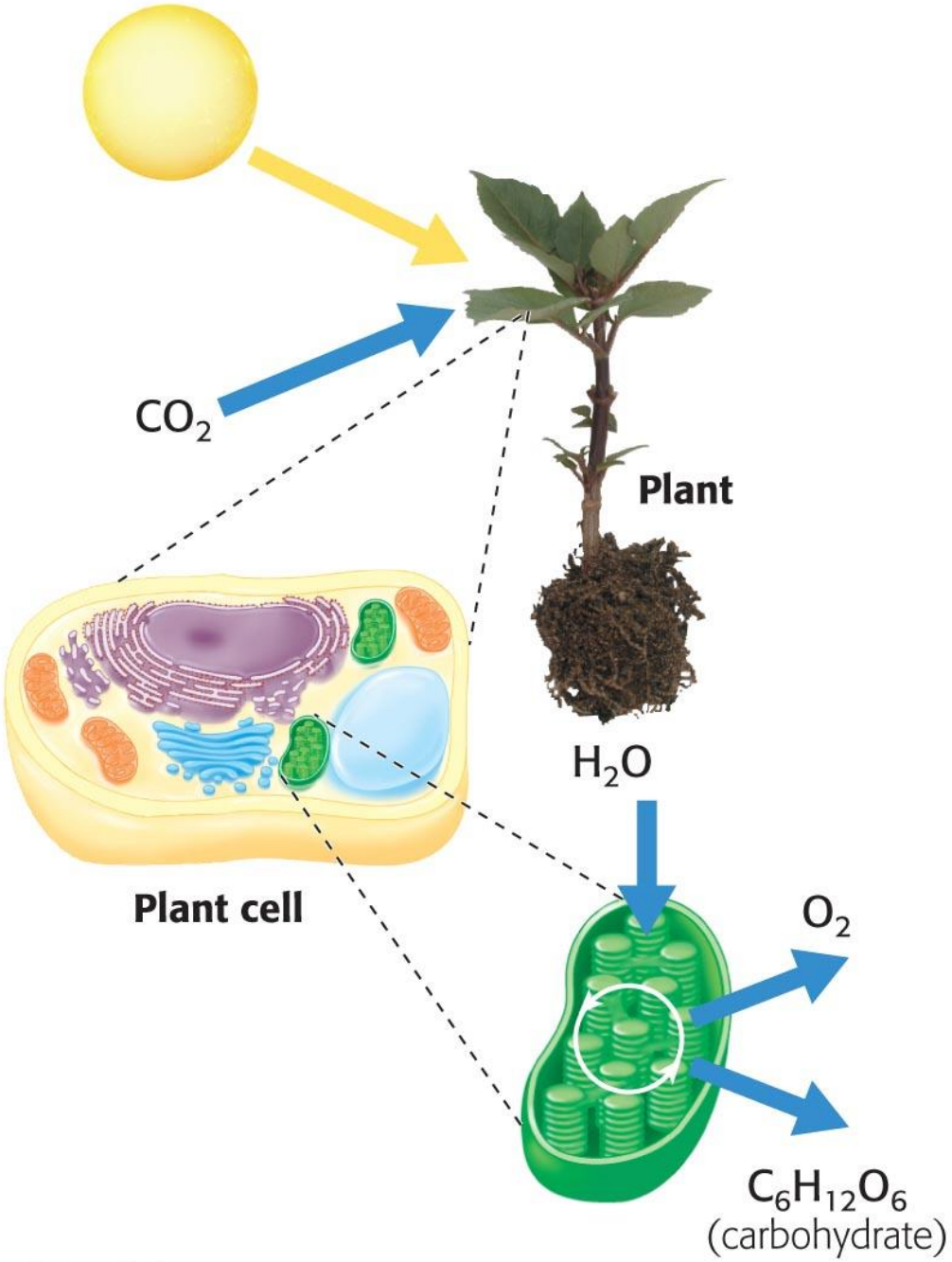
Prokaryotic cell





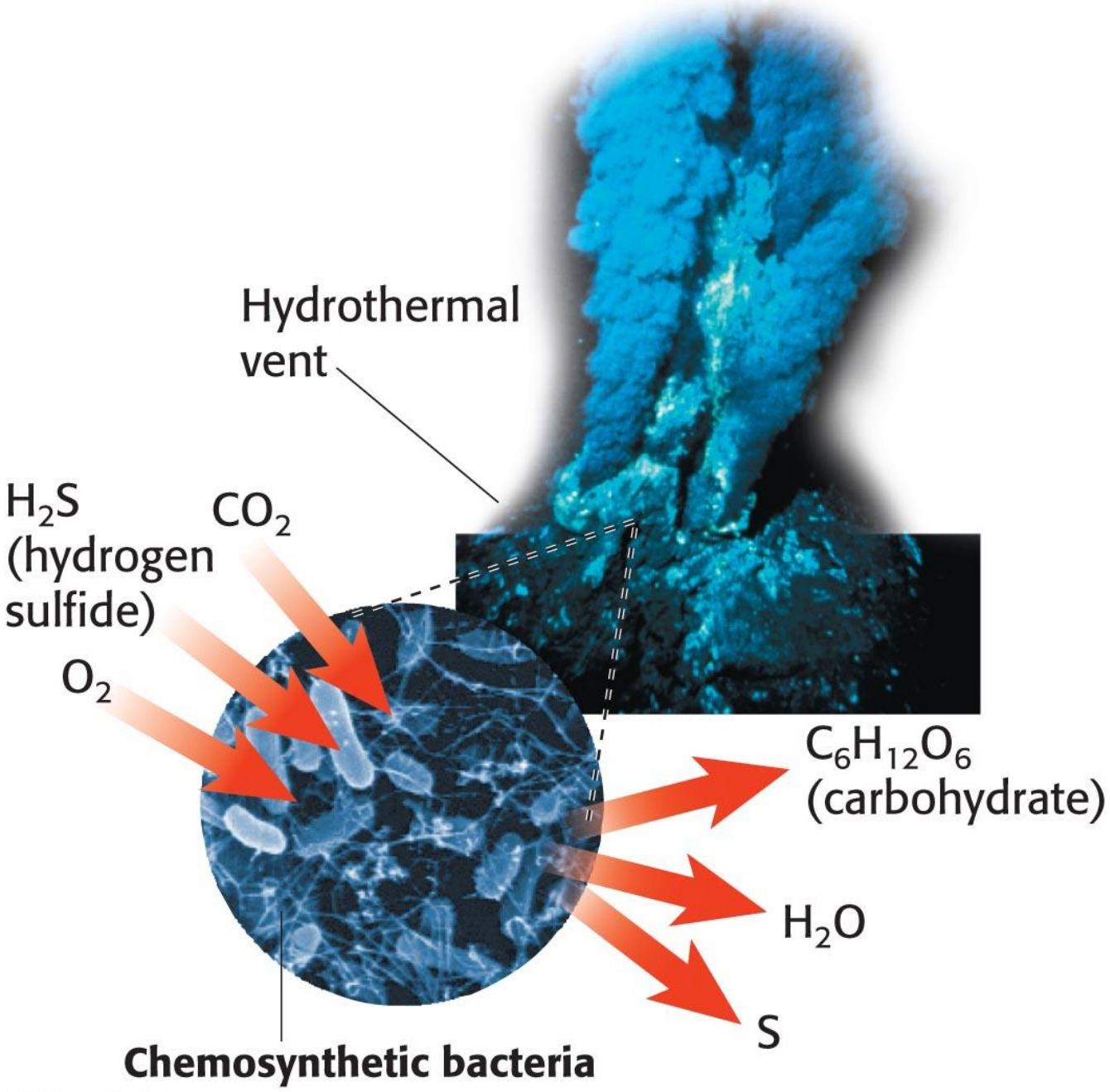
4.1 The Cell—The Fundamental Unit of Life

- Chemical functions
  - Photosynthesis
    - Used by plants
    - Uses sunlight, CO_2, and H_2O
    - Produces carbohydrates (sugars) and O_2
    - Carbohydrates power cellular processes



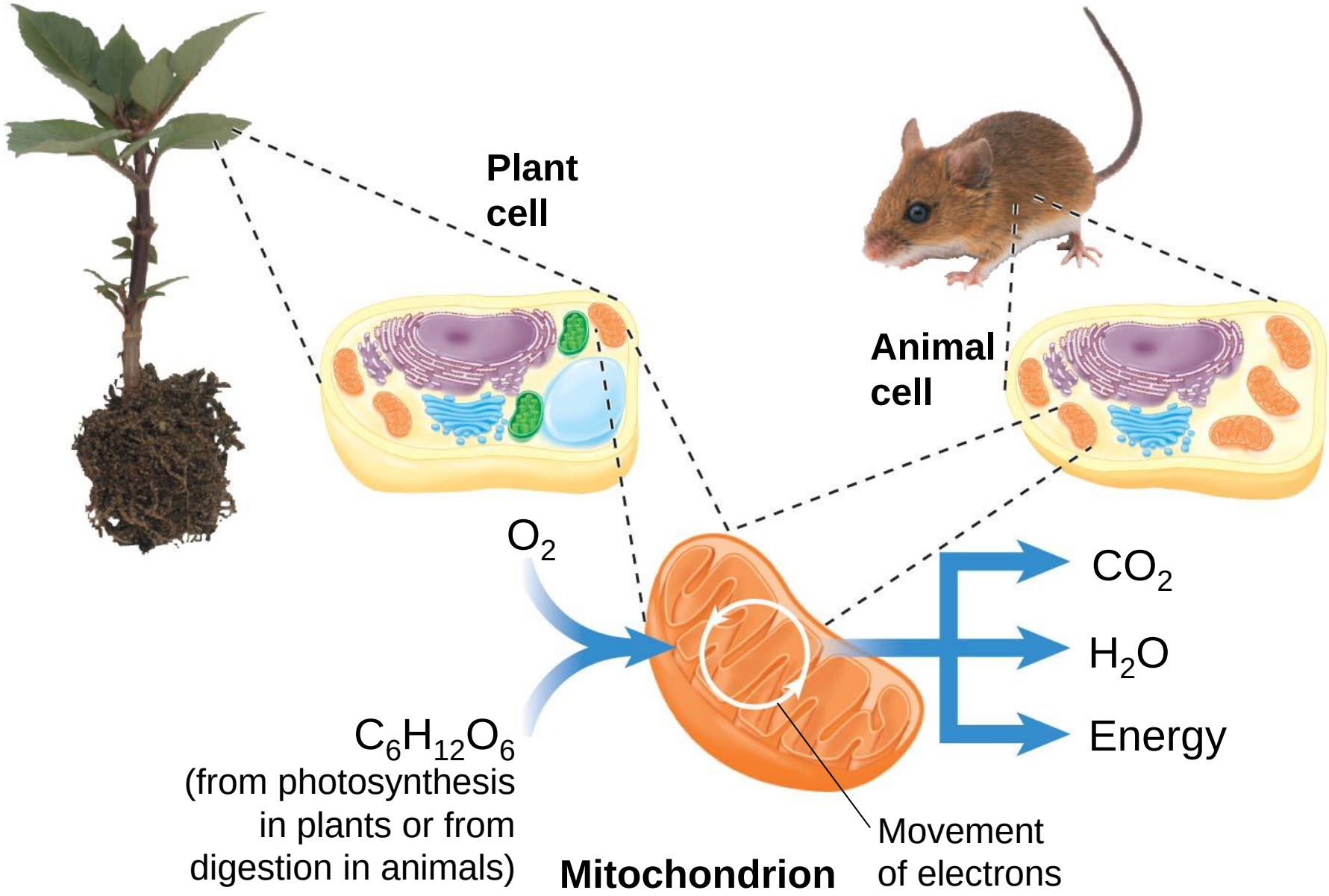
4.1 The Cell—The Fundamental Unit of Life

- Chemical functions
  - Chemosynthesis
    - Creates sugars from inorganic chemicals, CO_2 and O_2
    - Used by bacteria in ecosystems with no light
      - Ocean depths


Hydrothermal vent
H_2S (hydrogen sulfide)
CO_2
O_2
$C_6H_{12}O_6$ (carbohydrate)
H_2O
S
Chemosynthetic bacteria

4.1 The Cell—The Fundamental Unit of Life

- Chemical functions
  - Cellular respiration
    - Carbohydrates broken to power functions
    - Releases CO_2 and H_2O
    - Nearly all organisms use
    - Requires oxygen (aerobic)
  - Anaerobic respiration
    - Works without O_2
    - Yields less energy



4.2 The Growth and Reproduction of Organisms

- Asexual reproduction
  - Simple cell division
  - Genetically identical offspring
- Sexual reproduction
  - Requires two individuals
    - Gametes produced to form a zygote
  - Genetically diverse offspring